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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,592	07/11/2001	William Holm	0104-0354P	7653
2292	7590	05/02/2007	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH			PARKER, FREDERICK JOHN	
PO BOX 747			ART UNIT	PAPER NUMBER
FALLS CHURCH, VA 22040-0747			1762	
NOTIFICATION DATE		DELIVERY MODE		
05/02/2007		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/901,592	HOLM ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Frederick J. Parker	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 20 February 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8, 19, 20, 31, 34 and 37-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-8, 19, 20, 31, 34 and 37-42 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 2-20-07.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

#### ***Specification***

The amendments in response to the Objections to the abstract of the Previous Office Action are acknowledged and appreciated, and the Examiner withdraws the objections.

#### ***Claim Rejections - 35 USC § 112***

The amendments in response to the 35 USC 112/1<sup>st</sup> paragraph rejections of the Previous Office Action are acknowledged and appreciated, and the Examiner withdraws the rejections.

#### ***Claim Rejections - 35 USC § 102***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
  1. Claims 1,8,19,20,31,39 are rejected under 35 U.S.C. 102(e) as being anticipated by Takahashi et al US 6296896 (EFD 4-2-1996).

It is taught on col. 3, 1-17, that it is known to screen print an insulating substrate with a conductive material having an inherent viscosity suitable for screen printing, followed by applying droplets, e.g. by ink jet methods, of an additional material onto predetermined positions on the printed substrate. Specification page 4, 30+ permits jetting different materials than those initially applied. Since the claim never requires the ink jetted material to be applied onto screen printed portions of the substrate but merely “predetermined positions on the screen printed substrate...”, the limitation encompasses applying droplets onto the substrate on other than screen printed areas per fig. 3B,C and elsewhere. Regardless the ink jetted material flows onto the silk-screened depositions, so either way the limitation is met. Since multiple droplets are

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individually applied by jetting, initial drops are interpreted as add-on jetting of additional material, with subsequent droplet depositions being supplemental jetting. It is apparent the jetted liquids are applied prior to hardening of the screen printed material because the jetted droplets connect electrodes and are then dried and baked, col. 3, 15-16. Applicants are reminded the claims as written do not require more than jetting onto the “screen printed substrate” (i.e. either bare or screen printed portions) and therefore the reference meets the claim limitations. Further, the preamble simply states the substrate is arranged for mounting of components thereon, which is a statement of intended use which is given no patentable weight, given the process steps stand alone and the preamble does not give “life, meaning, and vitality” to the claim, MPEP 2111.02. The reference is fully capable of being arranged for mounting of components thereon, such as wires (see col. 17, etc).

2. Claims 1,8,19,20,31,37-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Zandman et al US 6271060 (EFD 8-13-1999).

The reference teaches to apply a polymer paste layer 210 having an inherent viscosity suitable for a screen printing application (fig. 2B, col. 5, 19-28), followed by applying solder balls onto solder paste applied using screen printing, jetting, etc (col. 7, 43-52; fig. 7A-B) to form semiconductor packages. Since the claim never requires the jetted material to be applied onto screen printed portions of the substrate but merely “positions on the screen printed substrate”, the limitation encompasses applying solder paste onto the substrate adjacent screen printed areas. Since multiple droplets are individually applied by jetting, initial drops are interpreted as add-on jetting of additional material, with subsequent droplet depositions being supplemental jetting.

Clearly one disclosed option applies solder paste or other adhesive which would necessarily NOT BE HARDENED when the solder ball is subsequently applied to pads (e.g. 208 S,G) to achieve the product of figures 7A,B. The adherence of solder balls to the paste on the pads is inherently impossible if the paste is hardened prior to deposition of the solder balls. The product is subsequently used in manufacturing a semi-conductor package which necessarily would have required the substrate being arranged for mounting of components to form the ultimate package.

***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al or Zandman et al.

Takahashi et al and Zandman are cited for the same reasons previously discussed, which are incorporated herein. Droplets of a predetermined size are not cited. However, one of ordinary skill would have known that a jet ejector operating at a specific set of conditions dispenses individual droplets each of essentially the same volume to provide uniform coating. Therefore the skilled artisan would have selected a jet dispenser which would have formed the deposition dimensions and volumes desired for a given end-use application, in this case the electro conductive film between the screen printed electrodes of Takahashi or the solder balls of Zandman to provide utility to the product.

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5. Claims 2-7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al or Zandman et al, in view of Itsuji US 5151299.

Takahashi et al and Zandman et al are cited for the same reasons previously discussed, which are incorporated herein. Removal of screen printed material is not cited. However, Itsuji teaches screen printing may result in deposited material being indistinct or blurred at edges, and therefore removal of such material enhances definition of the edges (col. 1, 44-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Takahashi et al or Zandman et al and incorporate the teachings of Itsuji to provide screen printed electrode depositions with well-defined edges.

As to claims 2,3,7, inspection of article and modification thereof prior to commercial use is simply quality control, which is an obvious step within the purview of one of ordinary skill in the art to remove reject parts or to modify parts with errors to make them economically useable.

6. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zandman et al. alone, or Takahashi in view of Zandman.

Takahashi et al and Zandman are cited for the same reasons previously discussed, which are incorporated herein. Col. 7, 43-52 states that either screen printing or jetting are suitable for applying solder paste of a viscosity, hence it would have been obvious to substitute one means for the other in any process step requiring the patterned or non-uniform coating of viscous materials onto a substrate. In Zandman or Takahashi in view of Zandman, the substitution of screen printing with jetting means to apply a viscous material would therefore have been an

obvious modification given the equivalence set forth by Zandman because of the expectation of achieving similar patterns/ non-uniform coatings.

***Response to Arguments***

Applicants arguments and amendments have been considered. The amendments to the claims have been dealt with above and will not be re-argued for sake of brevity. In summary, the rejections point out the references necessarily require add-on jetting prior to hardening of the first applied material, and that both references either are capable of or recite the substrate being arranged for mounting components thereto. Applicants argue the printed and jetted materials would need to be in a viscous form when components are mounted thereon. This argument is not commensurate with scope of claims which never recite any positive assembly step (class 29) and these arguments are moot. Additional arguments on page 10 - bridging 11 regarding “arranged for mounting components” is dealt with above. Applying the jetted material prior to hardening of the screen printed material is present in the references as discussed above. The additional steps of the references are permitted by applicants claims by virtue of the open ended transitional wording “comprising: per page 11 - bridging 12. Contrary to Applicants assertion that after fabricating must mean “after hardening” in Takahashi, that would be contrary to the previous recitations of forming both depositions followed by drying and baking on col. 3. Applicants argument on page 13 that the porosity of the screen printed depositions attest to the hardening is unconvincing; surely one of ordinary skill would have understood that an unhardened paste is more porous than a hardened/ sintered material, so it is the Examiner’s position that Applicants’ argument actually supports the Examiner’s position. Finally, the argument on page 14 that the

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paste must be already hardened when the solder balls are applied is entirely unconvincing because (1) the reference expressly teaches applying solder balls to the applied paste (necessarily unhardened) and further if the balls were applied to a hardened paste why would the solder balls stay stationary, or why even apply a paste if it is not used in the function of a paste/ adhesive??

Applicants arguments are not convincing and the rejections are maintained.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571/272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Frederick J. Parker  
Primary Examiner  
Art Unit 1762

fjp